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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference R-8804-4PCT1		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA416)	
International application No. PCT/ES 03/00583	International filing date (day/month/year) 18.11.2003	Priority date (day/month/year) 19.11.2002	
International Patent Classification (IPC) or both national classification and IPC B81B5/00			
Applicant BAOLAB MICROSYSTEMS S.L. et al.			



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 17.06.2004	Date of completion of this report 22.02.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Götz, A Telephone No. +49 89 2399-2498 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/ES 03/00583**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-26 as originally filed

Claims, Numbers

1-34 received on 14.01.2005 with letter of 10.01.2005

Drawings, Sheets

1/16-16/16 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/ES 03/00583**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-34
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-34
Industrial applicability (IA)	Yes: Claims	1-34
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/ES 03/00583

1 Reference is made to the following documents:

D1: US 2002 140 533 A (MIYAZAKI M ET AL) 3 October 2002
D2: EP-A-1 093 142 (LUCENT TECHNOLOGIES) 18 April 2001

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

- 2 Independent claim 1 of the present application is to such an extent unclear (Article 6 PCT) that assessment of novelty and inventive step is difficult. Claim 1 defines "a first zone" and "a second zone" and "a first condenser plate" and "a second condenser plate". Claim 1 defines that the "first condenser plate" and the "second condenser plate" are "arranged in said first zone" and "in said second zone" respectively. What the role of the "zones" is remains obscure. Besides the expression "being mechanically independent" from said first zone and second zone" is not clear. The meaning of something being "mechanically independent" from a zone is not understood. Should it mean that it is not mechanically connected to the zone, than this is not defined unmistakably in the claim by the present expression. Also, the expression just defines that said "conductive element" is "mechanically independent" from said "zones". This does in no way, however, exclude that said "conductive element" is mechanically connected to e.g. the substrate. It appears hence that the expression in question does not restrict the claim since it defines a technical feature (the "zones") without a clear function or arrangement and a relation of another technical feature (the "conductive element") with this senseless technical feature. Furthermore, the expression "said second plate is smaller than or equal to said first plate" equally does not restrict the scope of claim 1, since inevitably two plates are either of the same size or of different size.
- 3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D2 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses a miniaturised relay comprising:

- a first zone facing a second zone,
- a first condenser plate arranged in said first zone,
- a second condenser plate arranged in said second zone and facing said first condenser plate, in which said second plate is smaller than or equal to said first plate,
- an intermediate space arranged between said first zone and said second zone,
- a conductive element arranged in said intermediate space, said conductive element being mechanically independent from said first zone and second zone and being suitable for effecting a movement across said intermediate space from said first zone to said second zone and vice versa, (said) depending on voltages present in said first and second condenser plates,
- a first contact point of an electric circuit, in which said first contact point defines a first stop, in which said conductive element is suitable for entering into contact with said first stop and in which said conductive element closes said electric circuit when in contact with said first stop. See D2, figure 5: first condenser plate 20, second condenser plate 54, conductive element 22, first contact point 56.

The subject-matter of claim 1 therefore differs from this known relay in that claim 1 defines a second contact point of said electric circuit and that said conductive element is suitable for entering into contact with said second contact point.

It is, however, common in the technical field of miniaturised relays to close an electrical circuit by connecting two contacts with a conductive element, see D1, e.g. figures 3 and 4 and description thereof and hence the subject-matter of claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

- 4 The independent use claims 24-34 are also considered not inventive since they define the typical uses of relays.
- 5 Dependent claims 2-23 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

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CLAIMS

1.- Miniaturised relay characterised in that it comprises:

- a first zone facing a second zone,
- 5 - a first condenser plate (3) arranged in said first zone,
- a second condenser plate (9) arranged in said second zone and facing said first condenser plate (3), in which said second plate is smaller than or equal to said first plate,
- an intermediate space (25) arranged between said first zone and
- 10 said second zone,
- a conductive element (7) arranged in said intermediate space (25), said conductive element (7) being mechanically independent from said first zone and second zone and being suitable for effecting a movement across said intermediate space (25) from said first zone to said second zone and
- 15 vice versa, said depending on voltages present in said first and second condenser plates,
- a first contact point (15) of an electric circuit, a second contact point (17) of said electric circuit, in which said first and second contact points (15, 17) define first stops (13), in which said conductive element (7)
- 20 is suitable for entering into contact with said first stops (13) and in which said conductive element (7) closes said electric circuit when in contact with said first stops (13).

2.- Relay according to claim 1, characterised in that said first
25 contact point (15) is between said second zone and said conductive element (7).

3.- Relay according to one of claims 1 or 2, characterised in that
said second contact point (17) is likewise in said second zone.

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4.- Relay according to any of claims 1 to 3, characterised in that it comprises, additionally, a third condenser plate (11) arranged in said second zone, in which said third condenser plate (11) is smaller than or

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equal to said first condenser plate (3), and in which said second and third condenser plates are, together, larger than said first condenser plate (3).

5 5.- Relay according to one of claims 1 to 3, characterised in that it comprises, additionally, a third condenser plate (11) arranged in said second zone and a fourth condenser plate (5) arranged in said first zone, in which said first condenser plate (3) and said second condenser plate (9) are equal to each other, and said third condenser plate (11) and said fourth condenser plate (5) are equal to each other.

10

6.- Relay according to claim 5, characterised in that said first, second, third and fourth condenser plates are all equal to each other.

15 7.- Relay according to one of claims 5 or 6, characterised in that it comprises, additionally, a fifth condenser plate (35) arranged in said first zone and a sixth condenser plate (37) arranged in said second zone, in which said fifth condenser plate (35) and said sixth condenser plate (37) are equal to each other.

20

8.- Relay according to claim 7, characterised in that it comprises, six condenser plates arranged in said first zone and six condenser plates arranged in said second zone.

25 9.- Relay according to any of claims 1 to 8, characterised in that it comprises a second stop between said first zone and said conductive element (7).

30 10.- Relay according to any of claims 1 to 9, characterised in that it comprises a third contact point (21) arranged between said first zone and said conductive element (7), in which said third contact point (21) defines a second stop, such that said conductive element (7) closes a second electric circuit when in contact with said second contact point (17) and said third contact point (21).

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11.- Relay according to claim 10, characterised in that said
conductive element (7) comprises a hollow cylindrical part (31) which
defines a axis, in the interior of which is housed said second contact point
5 (17), and a flat part (33) which protrudes from one side of said radially
hollow cylindrical part (31) and which extends in the direction of said axis,
in which said flat part (33) has a height, measured in the direction of said
axis, which is less than the height of said cylindrical part (33) measured in
the direction of said axis.

10

12.- Relay according to claim 10, characterised in that said
conductive element (7) comprises a hollow parallelepipedic part which
defines a axis, in the interior of which is housed said second contact point
15 (17), and a flat part (33) which protrudes from one side of said radially
hollow parallelepipedic part (31) and which extends in the direction of said
axis, in which said flat part (33) has a height, measured in the direction of
said axis, which is less than the height of said parallelepipedic part,
measured in the direction of said axis.

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13.- Relay according to any of claims 1 to 8, characterised in that it
comprises a third contact point (21) and a fourth contact point (23)
arranged between said first zone and said conductive element (7), in which
said third contact point (21) and fourth contact point (23) define second
stops (19), such that said conductive element (7) closes a second electric
25 circuit when in contact with said third contact point (21) and fourth contact
point (23):

14.- Relay according to any of claims 1 to 13, characterised in that
each of the assemblies of said condenser plates arranged in each of said
30 first and second zones has central symmetry with respect to a centre of
symmetry, and in which said centre of symmetry is superposed to the
centre of masses of said conductive element (7).

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15.- Relay according to any of claims 1 to 13, characterised in that the assembly of said condenser plates arranged in each of said first and second zones has central asymmetry, thus generating a moment of forces with respect to the centre of masses of said conductive element (7).

5

16.- Relay according to any of claims 13 to 15, characterised in that between said first zone and said second zone extend two lateral walls (29), in which there is play between said lateral walls (29) and said conductive element (7), said play being sufficiently small so as to geometrically prevent said conductive element (7) from simultaneously entering into contact with a contact point of the group formed by said first and second contact points (15, 17) and with a contact point of the group formed by said third and fourth contact points (21, 23).

10

17.- Relay according to any of claims 1 to 16, characterised in that said conductive element (7) has rounded external surfaces.

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18.- Relay according to claim 17, characterised in that said conductive element (7) is cylindrical.

20

19.- Relay according to claim 17, characterised in that said conductive element (7) is spherical.

20.- Relay according to any of claims 1 to 18, characterised in that said conductive element (7) has an upper face and a lower face, said upper and lower faces being perpendicular to said movement of said conductive element (7), and at least one lateral face, in which said lateral face has slight protuberances.

25

21.- Relay according to any of claims 1 to 20, characterised in that said conductive element (7) is hollow.

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22.- Relay according to claim 1, characterised in that said first condenser plate (3) has a surface area which is equal to or double the surface area of said second condenser plate (9).

5 23.- Relay according to any of claims 1 to 22, characterised in that one of said condenser plates (3, 5, 9, 11, 35, 37) is, simultaneously one of said contact points (15, 17, 21, 23).

10 24.- Use of a relay according to any of claims 1 to 23, as accelerometer.

25.- Use of a relay according to any of claims 1 to 23, as accelerometer in airbags.

15 26.- Use of a relay according to any of claims 1 to 23, as tiltmeter.

27.- Use of a relay according to any of claims 1 to 23, as detector of Coriolis forces.

20 28.- Use of a relay according to any of claims 1 to 23, as pressure sensor.

25 29.- Use of a relay according to any of claims 1 to 23, as microphone.

30.- Use of a relay according to any of claims 1 to 23, as flow sensor.

30 31.- Use of a relay according to any of claims 1 to 23, as temperature sensor.

32.- Use of a relay according to any of claims 1 to 23, for acoustic applications.

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33.- Use of a relay according to any of claims 1 to 23, as gas sensor.

5 34.- Use of a relay according to any of claims 1 to 23, as magnetic field sensor.